INVESTIGATING DAM AND RESERVOIR LEAKAGES AND SAFETY (RAF/8/028) F4

New

MODEL PROJECT

CORE FINANCING

YEAR	Experts		Group Activity	Equipment	Fellowships		Scientific Visits		Group Training	Sub-Contracts	Misc. Comp.	TOTAL
	m/d	US $	US $	US $	m/d	US $	m/d	US $	US $	US $	US $	US $
1999	1/0	14,700	90,000	60,000	0/0	0	0/0	0	0	0	0	164,700
2000	1/0	15,450	110,000	50,000	0/0	0	0/0	0	0	0	0	175,450
2001	1/0	16,200	120,000	50,000	0/0	0	0/0	0	0	0	0	186,200

FOOTNOTE a/ FINANCING

YEAR	Experts		Group Activity	Equipment	Fellowships		Scientific Visits		Group Training	Sub-Contracts	Misc. Comp.	TOTAL
	m/d	US $	US $	US $	m/d	US $	m/d	US $	US $	US $	US $	US $
1999	0/0	0	310,000	150,000	0/0	0	0/0	0	0	0	0	460,000
2000	0/0	0	300,000	90,000	0/0	0	0/0	0	0	0	0	390,000
2001	0/0	0	200,000	50,000	0/0	0	0/0	0	0	0	0	250,000

First Year Approved: 1999

OBJECTIVES: Immediate: to investigate all reported significant dam leaks and recommend remedial measures; and to carry out on-site hydrological investigations prior to new construction. Long term: to establish a regional capability to address dam and reservoir leakages, thereby optimizing the conservation of water resources and rationalizing exploitation.

BACKGROUND: The 24 members of the African Regional Co-operative Agreement (AFRA), including 11 LDCs, share a common limitation regarding rational exploitation and management of diminishing water resources. Over the last decades these countries have constructed about 160 major dams and reservoirs. These are capital intensive investments that must be protected, and are mainly financed through loans. Most Member States lack the capacity to investigate leaks of unknown origin effectively, which results in the wastage of precious water resources and also poses potential safety hazards and threats to human settlements. Engineering solutions based on incomplete geological and hydrogeological data often fail to solve the problem on the first attempt. Scarce financial resources are wasted through a trial and error approach. Introduction of isotopic techniques is a cost effective way to ensure that corrective interventions are selected successfully. A preliminary AFRA survey of 12 countries indicated that over 40 dams showed signs of leakage - a number that will increase once additional responses from other countries are received and evaluated. The survey also revealed a shortage of national multidisciplinary expertise to monitor and manage these problems efficiently. The impermeabilization works carried out after dam construction are expensive and are mostly executed without sufficient technical knowledge. Many cases are known of dams where the organization responsible for their maintenance and management has had expensive repair work done without positive results. The investigation of leakage from dams requires detailed knowledge of the water dynamics at the dam site, which cannot be obtained through conventional methods only, but also requires tracer techniques based on both natural and artificial tracers. Only by using these tools can reliable information be obtained on the relationships between the water of the reservoir and that emerging downstream, and on the pathway of the water flows connecting the reservoir with springs. Tracer techniques are also instrumental in studies carried out before constructing the dam in order to gather basic feasibility information and also to provide valuable information for planning the impermeabilization works necessary during dam construction in order to prevent leakages. As these tracer techniques are not familiar to most dam construction companies in Africa, and repair works are based exclusively on conventional geological and hydrogeological data, and as great benefits are to be derived from successful identification of leakages, AFRA Member States decided to establish specialized teams which will help to conduct the required investigations and recommend implementable and cost effective solutions.

PROJECT PLAN: In collaboration with the local water administrations, interested environmentalist groups and government planning bodies, the specialized teams will define solutions and monitor their execution within an agreed implementation strategy. This approach stems from a recent successful identification of the origins of serious leakages in the Aoulouz dam in Morocco. In this particular instance, the projected savings directly attributable to the timely identification of the origins of leakages is estimated to run into several million dollars. In the light of this demonstrated success, the project will investigate the 40 dams and artificial reservoirs showing serious leakages and propose practical corrective measures. Additionally, the specialized teams will monitor and possibly participate in the implementation of the solutions to the identified leakages and assist in the qualification of sites before dam construction.

NATIONAL COMMITMENT: There will be 24 national counterparts from water administrations in the participating countries who will co-ordinate the activities of the specialized teams nationwide, ensure the implementation of remedial measures and liaise with AFRA and the Agency. Environmentalist groups, ministries of agriculture and hydrology laboratories will be involved at an early stage. The recipient countries will provide staff and logistic support at the times and in the quantities agreed upon in the project workplan. AFRA Member States will assume full responsibility for the implementation of the corrective measures.

AGENCY INPUT: The Agency will arrange for the specialized teams to investigate the reported leaking dams by covering their costs of transportation, necessary equipment and living expenses in the recipient countries. The expected extrabudgetary contributions from donors will cover the costs of some equipment needed for undertaking investigations at the dam sites as well as the activities of the specialized teams in the recipient AFRA countries. Co-ordination and monitoring of the activities will be performed in close collaboration with the AFRA field management, which will be provided with advisory assistance to design an adequate strategy to enable the specialized teams to become financially autonomous once the Agency assistance is terminated.

PROJECT IMPACT: In the short term, all reported leaking dams and reservoirs will be investigated and corrective measures made available to the participating countries, including advice on implementation procedures. In the long term, the project will facilitate the establishment of mechanisms whereby the specialized teams will become financially autonomous beyond the completion of the project, thereby promoting sustainability of critical services on the continent and reducing dependency on outside expertise.